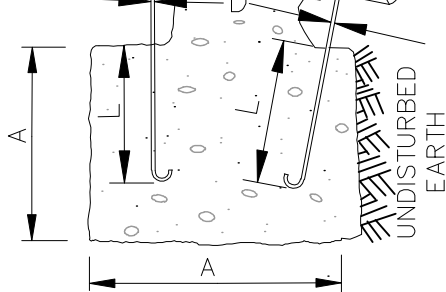


PIPE CLAMPS & STAINLESS STEEL RODS (SEE NOTE 4)

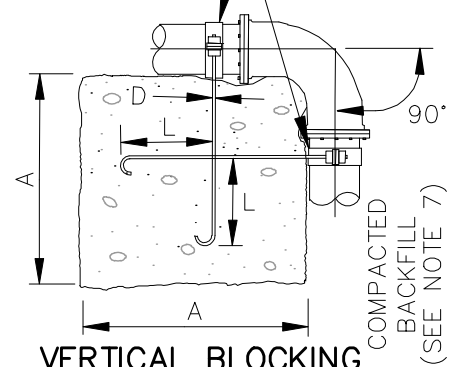
SEE DETAIL W-5; APPLIES TO ALL ANCHORS

VERT. BEND



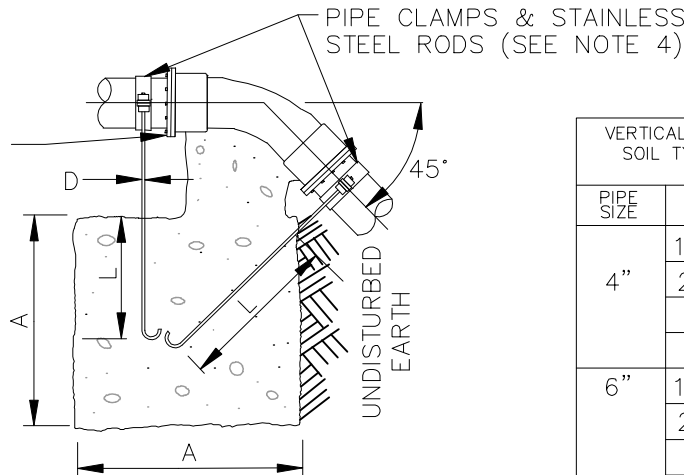
**VERTICAL BLOCKING**  
**11 1/4° & 22 1/2° BENDS**

PIPE CLAMPS & STAINLESS STEEL RODS (SEE NOTE 4)



**VERTICAL BLOCKING**  
**FOR 90° BENDS**  
(SEE NOTE 6)

SEE NOTE 9 (TYPICAL)



**VERTICAL BLOCKING**  
**FOR 45° BENDS**

**NOTES:**

- NO CHANGE IN PIPE DIRECTION OR DIAMETER SHALL OCCUR WITHIN 36 FEET OF THE VERTICAL BEND. BENDS, TEES, REDUCERS, ETC. BEYOND THE 36 FOOT LIMIT SHALL BE RESTRAINED BY STANDARD CONCRETE BLOCKING PER STD. DTL. W-1 & W-3. CONCRETE BLOCKING SIZES BASED ON:
  - 36 FEET OF PIPE RESTRAINED EACH SIDE OF BEND.
  - THRUST BLOCK AREAS BASED ON SAFE BEARING LOAD OF 1,000 PSF.
  - 2,500 PSI CONCRETE.
  - MINIMUM 3 FEET OF COVER.
  - PIPE THRUST BASED ON 200 PSI PRESSURE.
  - PIPE ENCASED IN POLYETHYLENE.
  - VERTICAL BLOCK SIZE BASED ON CONCRETE WEIGHT OF 150 POUNDS PER CUBIC FOOT.
  - TRENCH CONDITIONS BASED ON TYPE 2, FLAT BOTTOM TRENCH WITH LIGHTLY CONSOLIDATED BACKFILL, PER ANSI/AWWA C150/A21.50.
  - FACTOR OF SAFETY IS 1.5.
  - SOIL FRICTIONAL RESISTANCE BASED ON COHESIVE GRANULAR SOIL TYPE (GC+SC). SAND, GRAVEL, CLAY MIXTURE.
- BLOCKING DESIGN MUST BE ADJUSTED FOR OTHER SIZE PIPE, PRESSURES AND SOIL CONDITIONS.
- PIPE CLAMP (STAINLESS STEEL TOLCO 4H 316SS). RODS (STAINLESS STEEL ALL-THREAD 316SS)
- LINE SHALL NOT BE PRESSURIZED UNTIL ALL TRENCHING WITHIN 100 FEET OF VERTICAL BEND IS BACKFILLED AND COMPACTED TO MINIMUM COVER OF 3 FEET OVER PIPE.
- 90° VERTICAL BENDS SHALL ONLY BE INSTALLED WHERE GIVEN PRIOR APPROVAL BY THE UTILITY.
- BACKFILL TRENCH BEYOND 90° VERTICAL BLOCK WITH CRUSHED SURFACING TOP COURSE MATERIAL COMPACTED TO 95% MAXIMUM DENSITY. CRUSHED BACKFILL SHALL EXTEND 20 FEET BEYOND BLOCK OR TO FIRM BEARING TRENCH WALL, WHICHEVER IS LESS.
- LEAVE BLOCK OPEN OR SHEETED 24 HOURS MINIMUM.
- MEGA-LUG FITTINGS.

VERTICAL BLOCKING SIZE W/RESTRAINED JOINTS SOIL TYPE = COHESIVE GRANULAR [GC+SC] SAND, GRAVEL, CLAY MIXTURE					
PIPE SIZE	V B	CU FT	A	D	L
4"	11 1/4°	*			
	22 1/2°	*			
	45°	*			
	90°	16	2.5'	3/4"	2.0'
6"	11 1/4°	*			
	22 1/2°	*			
	45°	13	2.3'	3/4"	2.0'
	90°	43	3.5'	3/4"	2.0'
8"	11 1/4°	*			
	22 1/2°	*			
	45°	33	3.2'	3/4"	2.0'
	90°	86	4.4'	3/4"	2.0'
10"	11 1/4°	*			
	22 1/2°	13	2.3'	3/4"	2.0'
	45°	64	4.0'	3/4"	2.0'
	90°	141	5.2'	1"	3.5'
12"	11 1/4°	*			
	22 1/2°	20	2.7'	3/4"	2.0'
	45°	111	4.8'	3/4"	2.0'
	90°	206	5.9'	1 1/8"	4.0'

\* BLOCKING NOT REQUIRED IF 36 FEET OF PIPE IS RESTRAINED ON EACH SIDE OF BEND.



**City of  
Bellevue**

VERTICAL BLOCKING  
WITH RESTRAINED JOINTS  
FOR NEW LINES